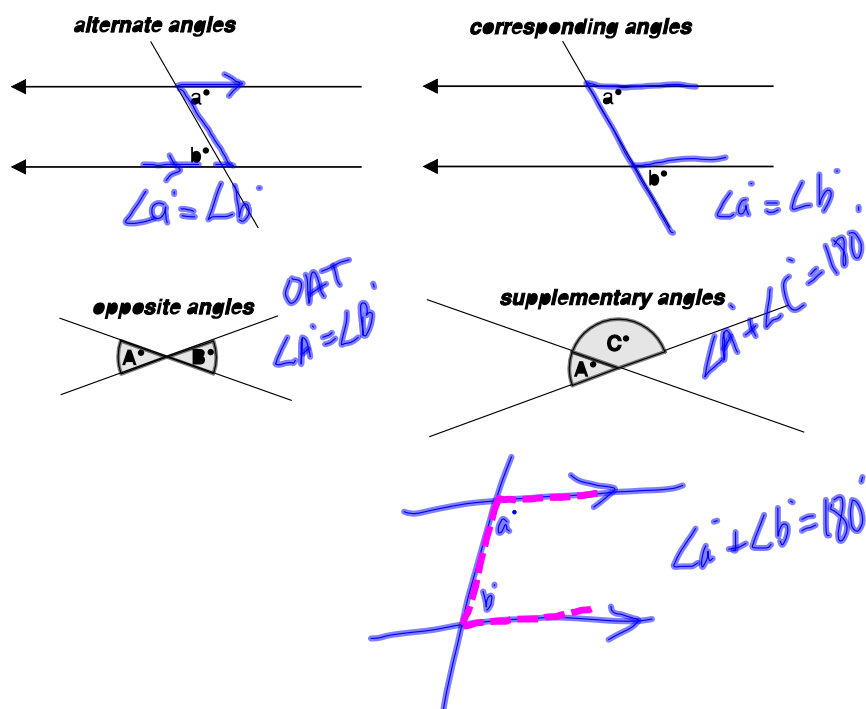


L9 - Applications of Linear Systems: Geometry, Money and Number Problems

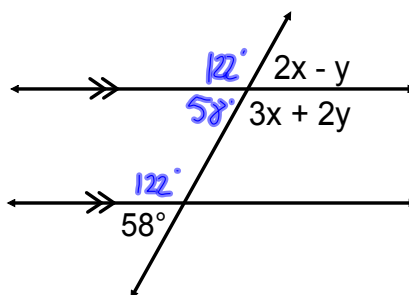
Recall:



Ex.1. Determine the value of x and y .

$$\begin{aligned} \textcircled{1} (2x - y = 58) \times 2 \\ \textcircled{2} 3x + 2y = 122 \end{aligned}$$

$$\begin{aligned} \textcircled{1} 4x - 2y &= 116 \\ + \textcircled{2} 3x + 2y &= 122 \\ \hline 7x &= 238 \\ x &= 34 \end{aligned}$$



$$\begin{aligned} \text{Sub } x = 34 \text{ into } \textcircled{1} \\ 4x - 2y &= 116 \\ 4(34) - 2y &= 116 \\ y &= 10 \end{aligned}$$

Ex. 2) The coin box of a vending machine contains half as many quarters as dimes. If the total value of the coins is \$22.50, how many dimes are there?

① $2q = d$ dimes = 0.10
quarters = 0.25
nickles = 0.05

② $(0.25q + 0.10d = 22.50) \times 100$

Sub $d = 2q$ into ②

$$25q + 10d = 2250$$

$$25q + 10(2q) = 2250$$

$$\frac{45q}{45} = \frac{2250}{45}$$

$$q = 50$$

Sub $q = 50$ into ①

$$d = 2(50)$$

$$d = 100$$

\therefore there are 50 quarters and 100 dimes.

Ex. 3) A rectangle with a perimeter of 180 cm is four times longer than it is wide. What are the dimensions of the rectangle?

① $2l + 2w = 180$ Perimeter

② $l = 4w$

Let l represent length
Let w represent width.

ANS

$$w = 18$$

$$l = 72$$

Ex. 4) The sum of two numbers is 72. Their difference is 48. Find the numbers.

$$\begin{array}{lcl}
 \textcircled{1} & x + y = 72 & \text{Sub } y = 12 \text{ into } \textcircled{1} \\
 \textcircled{2} & x - y = 48 & x + (12) = 72 \\
 & & x = 72 - 12 \\
 & & x = 60 \\
 \textcircled{1} - \textcircled{2} & 2y = 72 - 48 & \\
 & 2y = 24 & \\
 & y = 12 & \text{let } x \text{ represent 1st number} \\
 & & \text{let } y \text{ represent 2nd number} \\
 & & \therefore \text{The first number is 60 and} \\
 & & \text{second number is 12}
 \end{array}$$

Assigned Work:

- 1) Erik has \$4.80 in nickels and quarters. If he has 6 more nickels than quarters, how many of each does he have?
- 2) Hakim invested \$15 000. He put part of it in a term deposit that paid 4% per year and the remainder in a Canadian bond that paid 5% per year. After one year, the total interest was \$690. How much did Hakim invest at each rate?
- 3) The Student Council held a car wash to raise money. They washed cars for \$5 each and vans for \$7 each. They washed 45 vehicles and earned \$243. How many of each type of vehicle did they wash?

equations: 1) $0.05x + 0.25y = 4.80$
 $x - y = 6$

2) $0.04x + 0.05y = 690$
 $x + y = 15000$

3) $5x + 7y = 243$
 $x + y = 45$

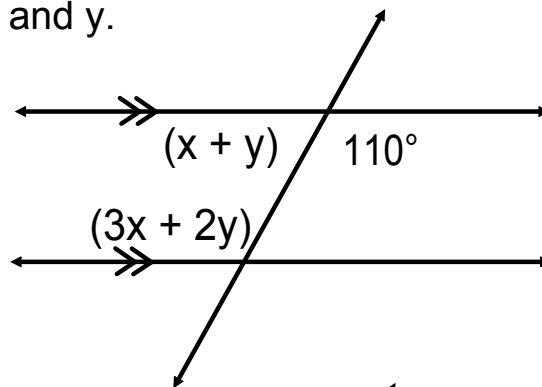
- 4) Two persons share a lottery worth \$1200. One person received \$800 less than 3 times what the other person received. How much did each person receive?
- 5) Wilfrid has a total of 23 dimes and quarters. The total value amounts to \$2.90. How many coins of each kind does he have?
- 6) In the good old days, ice cream cones cost 20 cents for a single scoop and 35 cent for a double scoop. If a vendor sold \$30 worth of ice cream in a ratio of 2:1 single to double scoops, how many of each kind did he sell?

Answers: 4) $x + y = 1200$
 $y = 3x - 800$
 $x = 500$ & $y = 700$

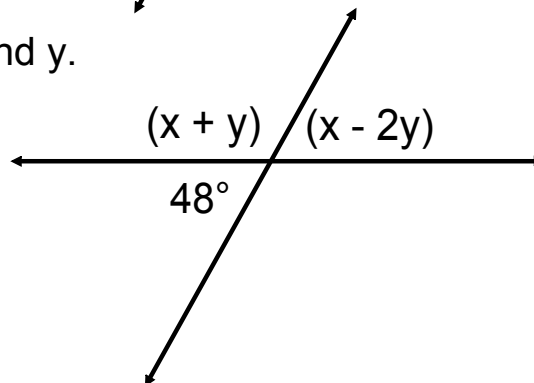
5) $x + y = 23$
 $0.25x + 0.10y = 2.90$
 $x = 4$ & $y = 19$

6) $0.20x + 0.35 = 30$
 $x = 2y$
 $x = 80$ & $y = 40$

- 7) Determine the value of x and y .



- 8) Determine the value of x and y .



Also p. 40 #17* and p. 55 #9

Review for Test: p. 62 #5a, 6, 7bc, 9, 12acd, 13, 14, 16, 17, 18